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# Llamas: Possible new weapon against the flu

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Scientists think they have developed a universal flu vaccine. The key ingredient that can take on the flu virus may come from llamas. Photo: Dreamstime/TNS

Llamas are very cute animals. They are very fluffy and look huggable. However, llamas also have a special secret power. Their bodies are unusually good at fighting off viruses and diseases.

Llamas make antibodies so tiny they can fit into small openings on the surface of a virus. Antibodies are proteins produced by the body whenever viruses are detected in the bloodstream. They help the body fight against a virus's attack.

Llama antibodies could one day protect humans from a wide range of flu viruses. Flu, or influenza, kills as many as 650,000 people each year, according to the World Health Organization. The organization is a part of the United Nations. It is concerned with international public health.

## Once-A-Year Puff Up The Nose

All it might take to fight off the flu is a once-a-year puff up the nose.

A team from the Scripps Research Institute in California discovered the llama's special antibodies. They may now be close to developing a vaccine that will work against all types of influenza.

Vaccines are like medicines, except their purpose is to kick off the body's own defenses. Each vaccine contains tiny traces of the virus it was developed to protect against. It helps the body begin producing the right antibodies.

Currently, separate vaccines need to be developed for each type of flu. It can be very hard to guess which type will be the biggest danger in any particular flu season. Additionally, new forms of flu are constantly popping up.

The Scripps team tested their new vaccine nose spray on mice. It gave the animals complete protection against many kinds of flu that affect humans.

Anthony Fauci is a leader at the National Institute of Allergy and Infectious Diseases. He praised the new study. Fauci said the study showed that creating vaccines that could knock down a bunch of viruses that change or pop up was the only way to protect humans. This is especially important for people who have delicate immune systems. These people get sick easily.

## Brand New Approach

To meet those goals, the Scripps team tried a brand new approach. They borrowed ideas from different science branches.

First, they vaccinated llamas against a number of types of influenza. Then, the scientists took blood samples from the animals. They did this to collect the antibodies the llamas had produced in response to the vaccines.

Among the antibodies they found were four highly unusual ones. They were very small and were able to destroy many different kinds of influenza. Because "nano" means "very small," the scientists called them "nanobodies."

The scientists took these llama nanobodies and combined them into a single new protein. It is capable of squeezing into spaces on a virus' surface that are too small for most proteins. The scientists named their new antibody "MD3606." They say it can provide protection against nearly any type of flu.

However, the team still faced one big problem. They couldn't simply put MD3606 into a body. They had to come up with a vaccine that would make a body produce the antibody on its own. And they had to make sure that would be possible even when a body is weakened by age, stress or disease.

## Powerhouse Protein

To solve those challenges, the team built a new gene. It has the production plans for MD3606 encoded into it. Once inside a body, it would be capable of producing the powerhouse protein.

Next, the team put their gene into a harmless virus. This virus can be introduced into a body via the team's nose spray. It not only brings in the antibody. It also delivers the manufacturing machinery to produce more of it. This makes the vaccine equally effective in everyone.

Most likely, the new vaccine would need to be given each year. Over time, new antibodies might have to be added to the vaccine.

In any case, scientists say much still needs to be learned. It is not yet clear if the new vaccine will really work with people. Human bodies might see the llama-based proteins as foreign and attack them.

The Scripps team's next step is to run further tests.